EXECUTIVE SUMMARY

Green Technology Startups Landscape Study in Indonesia

kerja sama jerman
DEUTSCHE ZUSAMMENARBEIT

Implemented by
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Kementerian PPN/
Bappenas

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Study Background

Southeast Asia, including Indonesia, has been considered a promising market for the tech industry for the past decade, with startups offering innovative solutions and products. Indonesia has consistently shown its economic growth over the past 10 years, including the development of its digital economy. According to the 2019 World Economic Forum report, Indonesia tops the list of countries when it comes to the number of people who aspire to become entrepreneurs.[1] Despite having more than 6,000 startups and receiving US$250 million in funding, there are still relatively few startups in the green technology sector.

The main focus of most venture capitals and other funders is still on internet and mobile-related startups. However, there is growing interest from venture capital organisations to invest in the green technology sector.

Indonesia's digital economy is the largest among ASEAN member countries. This makes Indonesia one of the most attractive investment destinations for digital products/services. The total investment in the digital sector was $4.5 billion in 2020 and $9.1 billion in 2021.[2] Amidst the rapid growth of the digital economy, the Indonesian government also aims to have sustainable long-term economic success through green economy and technology development. Green economy and technology development will contribute significantly to economic success with better social outcomes and better preservation of Indonesia's environment and natural resources.[3] [4] Entrepreneurs and funding agencies can take advantage of these economic trends and progress, but there is a responsibility to make this growth sustainable in terms of infrastructure, environment, and human development. Along with this goal, Indonesia consistently encourages the development of innovation, where one of the strong growths in Indonesia is the development of its startup ecosystem.

1. Wood, J. (2019, August 16). In Indonesia, over a third of young people want to be entrepreneurs. World Economic Forum. https://www.weforum.org/agenda/2019/08/indonesia-young-people-entrepreneur/

2. Google, Temasek, and Bain &; Company (2022), e-Conomy SEA 2022 – Through the Waves, Towards a Sea of Opportunity. https://economysea.withgoogle.com/home/

3. Government of Indonesia - GGGI Green Growth Program. (2015). Delivering Green Growth for a Prosperous Indonesia. Bappenas. http://greengrowth.bappenas.go.id/wp-content/uploads/2018/02/201512221340.GGGI_Roadmap_Full_English_spread_lores.pdf

4. Sapulette, M.S., &; Muchtar, P. A. (2023). Redefining Indonesia's Digital Economy. In https://www.eria.org/. Economic Research Institute for ASEAN and East Asia. https://www.eria.org/uploads/media/policy-brief/FY2022/Redefining-Indonesia%E2%80%99s-Digital-Economy.pdf

Industry actors in the green technology ecosystem have their own views on the green technology's scope of work, the definition of this sector, as well as varying networks and investment portfolios to support startups in this sector. Therefore, one approach to better understand about this ecosystem is to conduct a study on the ecosystem landscape of green technology startups in Indonesia.

This research was conducted as part of Digital Transformation Center (DTC) and Make-IT Indonesia project by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH together with the Kementerian PPN/Bappenas.

About The Study

This study attempts to map out the landscape of the green technology ecosystem in Indonesia, particularly regarding the development of startups in this sector, which includes several key findings as follows:

1	Mapping the landscape of green technology ecosystems in Indonesia, both digital and non-digital startups.
2	Categorisation of green technology-related projects/business activities/companies within the areas of clean energy transition, circular economy, as well as natural resource management. In addition, a practical definition of green technology in Indonesia agreed upon by various actors is explained, as well as further classification of green technology within the sector.
3	A closer look at the statistics of startups that have partnered with the Indonesian government and/or private sector.
4	Compile government entities that have and could potentially engage in cooperation with green technology startups in Indonesia.
5	Measuring the amount of impact investment that has been realized for green technology sector startups in Indonesia up to the first quarter of 2023.
6	Suggestions and recommendations to strategically support this ecosystem and mainstream green technology in Indonesia.

To obtain the findings mentioned above, the research team collected a database of industry actors involved in the development of the green technology ecosystem in Indonesia. Those industry actors consisting of startups, enablers, as well as capital providers who have disbursed funds to green technology sector in Indonesia. The startups included in this summary have a business model engaged in the areas of clean energy transition, circular economy, and natural resource management, originating from Indonesia. Meanwhile, the enablers that the research team included in this study are not only those from Indonesia, but the one that also have portfolios in Indonesia.

After the database was completed, the research team distributed questionnaires to all registered respondents and made interview requests to several industry actors. This was done to better understand the aspirations of industry actors from various perspectives.

Study Data

To collect information on the green technology industry actors to be included in the GIZ and Kementerian PPN/Bappenas databases, the research team drew on the team's existing networks and some additional industry actors' data from media coverage information, networking at events, and inputs from GIZ and Kementerian PPN/Bappenas. The total number of industry actors in the ecosystem landscape of green technology startups in Indonesia that have been successfully recorded in the database is 237 actors.

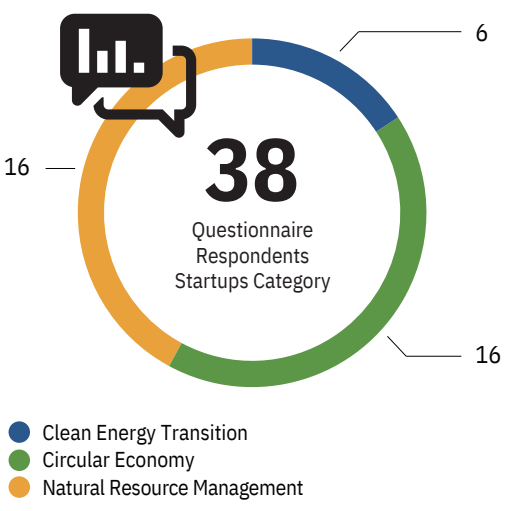
Besides performing a literature study based on the database, this study managed to collect 38 startups questionnaire's respondent from the areas of clean energy transition (6 respondents), circular economy (16 respondents), and natural resource management (16 respondents). The disparity in the number of respondents is due to different number of industry actors in each of these sectors that the research team could identify, as well as the limited openness of industry actors to be involved in this study.

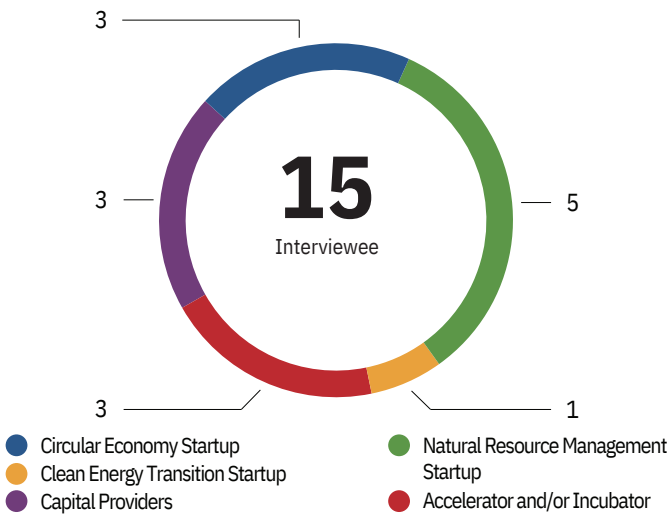
The research team has also interviewed 15 resource persons from different entities, with a composition of 3 circular economy startups, 5 natural resource management startups, 1 clean energy transition startup, 3 accelerators and/or incubators, and 3 capital providers.

Study Highlight

Definition and Classification of Green Technology

According to green technology industry actors, the definition of the term 'green technology' in Indonesia is the use of technology as a solution in the context of sustainable development (sustainability), which aims to support environmentally friendly businesses to reduce negative impacts on the environment, including optimizing utilization of natural resources. The technology is not only limited to software, but also the hardware used to achieve the purpose of using green technology.





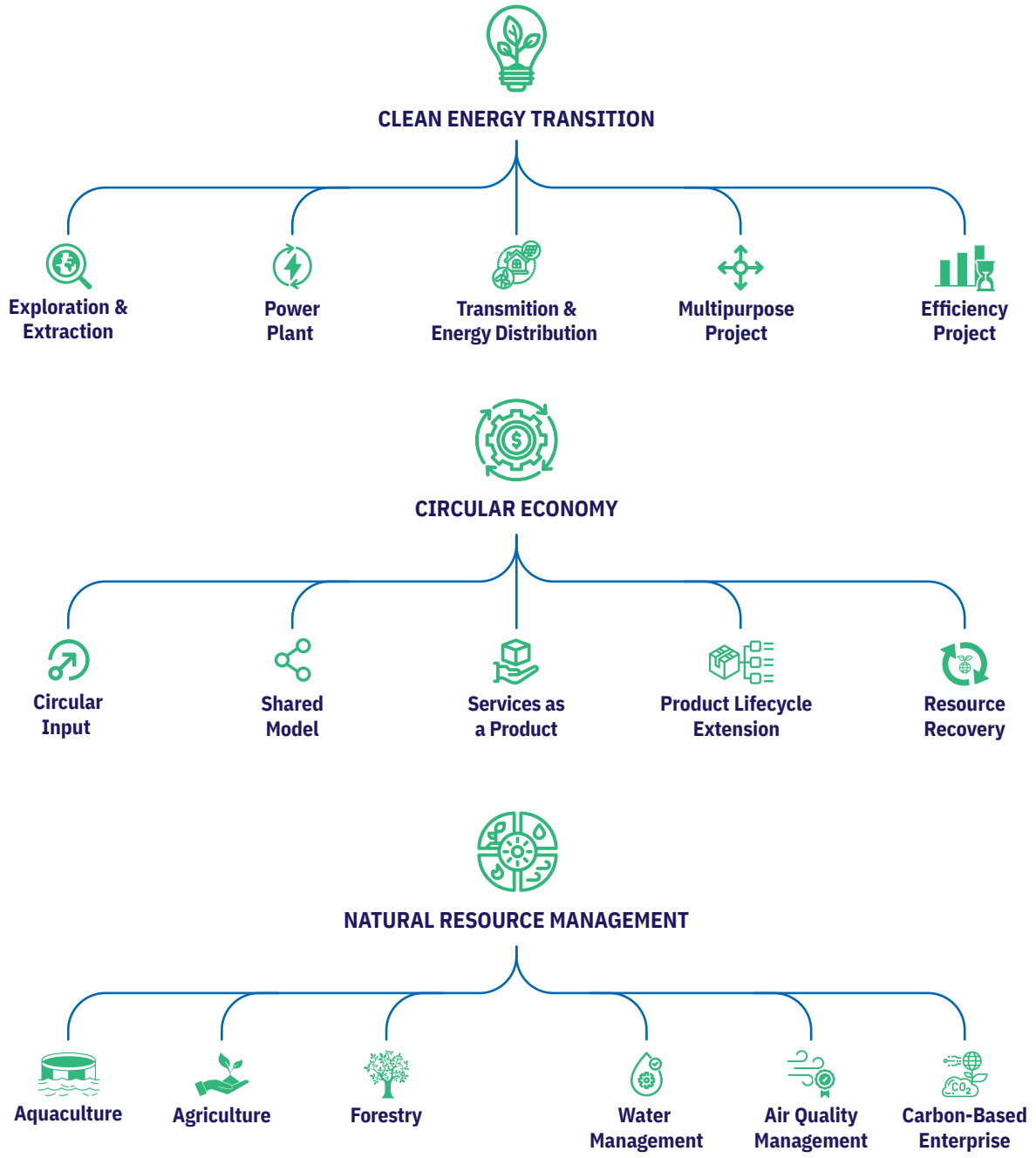
Definition of Green Technology According to Green Technology Startups in Indonesia

(Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas)

The digital aspect of green technology industry actors is still heavy on the downstream side, for example the use of technology for mass/customer communication or marketing channels such as the use of social media and marketplaces.

Carbon-based enterprises are categorized under the umbrella of the natural resource management sector as it refers to the background of Presidential Regulation (PERPRES) Number 98 of 2021 on the Implementation of Carbon Economic Value for Achieving Nationally Determined Contribution Targets and Controlling Greenhouse Gas Emissions in National Development part c:

"that carbon as a universal indicator in measuring the performance of climate change control efforts reflected in nationally determined contributions, in addition to having an important economic value and having an international dimension, mainly in the form of economic benefits for the community, as well as a reflection of the principle of sustainable resource management in accordance with the mandate of Article 33 paragraph (4) of the 1945 Constitution of the Republic of Indonesia"


CLEAN ENERGY TRANSITION
Exploration & Extraction
Power Plant
Transmition & Energy Distribution
Multipurpose Project
Efficiency Project
CIRCULAR ECONOMY
Circular Input
Shared Model
Services as a Product
Product Lifecycle Extension
Resource Recovery
NATURAL RESOURCE MANAGEMENT
Aquaculture
Agriculture
Forestry
Water Management
Air Quality Management
Carbon-Based Enterprise

The majority of clean energy transition startups in Indonesia are in the power generation subsector. Startups in the circular economy sector mostly focus on resource recovery business models. In the natural resource management sector, agricultural subsector is the majority focus area of the startups.

Number of Startups in the Green Technology Sector in Indonesia

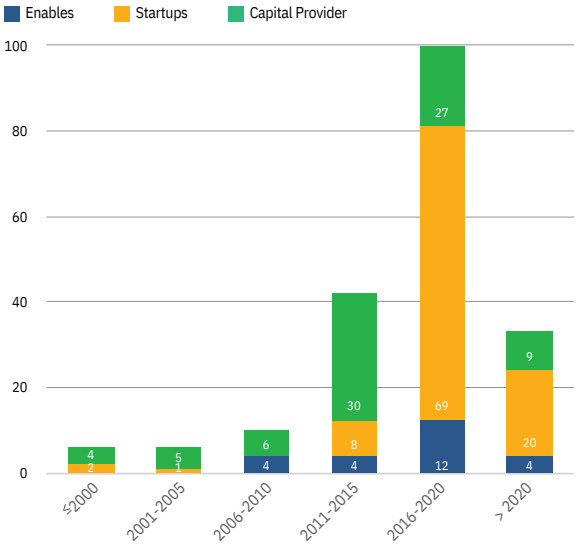
Source: GIZ and Kementerian PPN/Bappenas Database

Green Technology Business Actor

Green technology business actors in Indonesia are divided into several entities, namely startups, enablers, and capital providers. If we add up all the startups and supporting institutions such as enablers and capital providers, the 2016-2020 is the period with the most industry actors' emergence. The surge is more than doubled compared to the previous period of 2011-2015 with 42 industry actors.

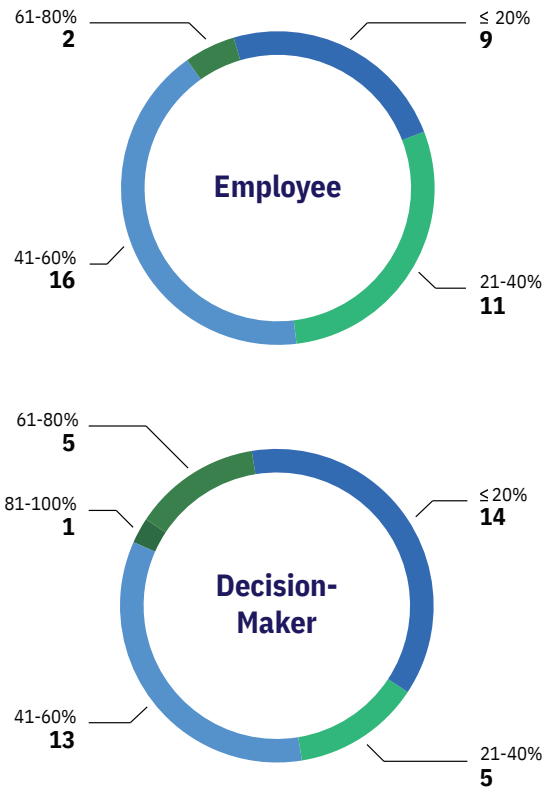
Gender equality within the respondent companies in the categories of startups, enablers, and capital providers seems to be quite good, particularly in terms of the percentage of female employees in the decision-making position. Relative to the total number of employees, the percentage of startups, enablers, and capital providers that have a ratio of female employees above 40% is quite varied, with 91.6% of companies in enablers side, 50% of companies in capital providers side, and 47.3% in startups side.

The Comparison of the Emergence of Players in the Green Technology Industry Sector in Indonesia

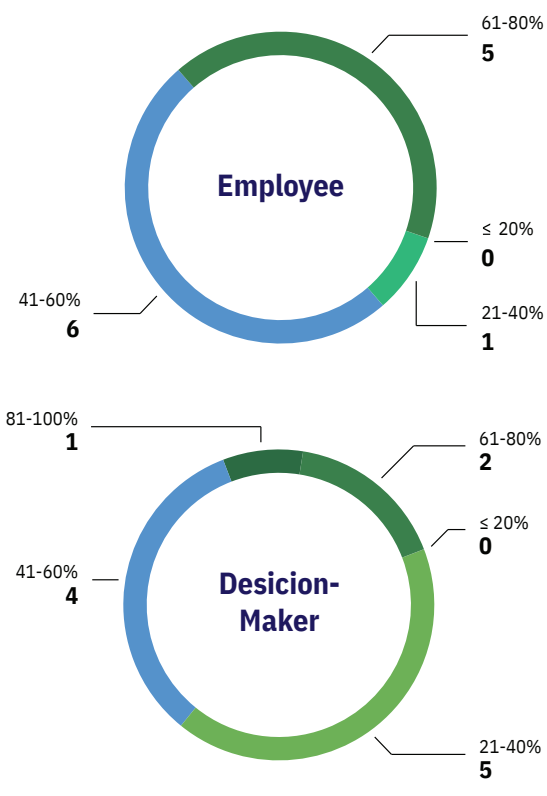


Source: GIZ and Kementerian PPN/Bappenas database

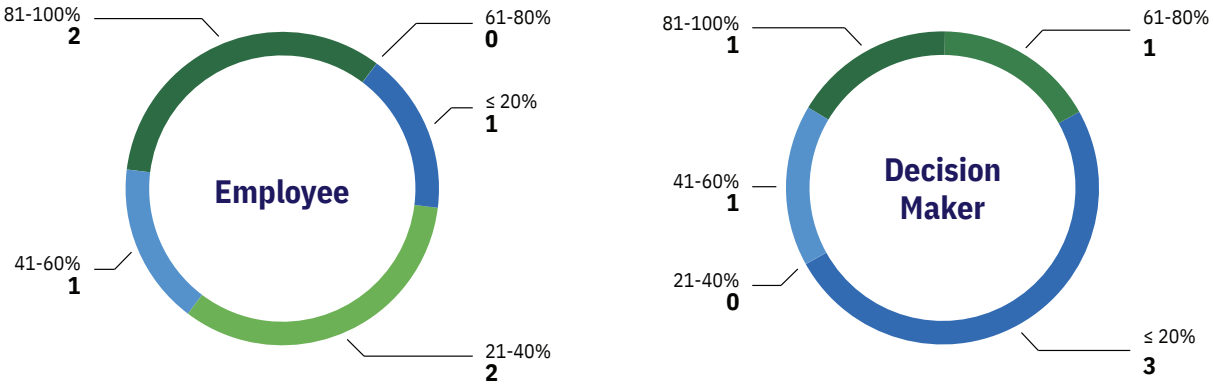
Startups



Enablers



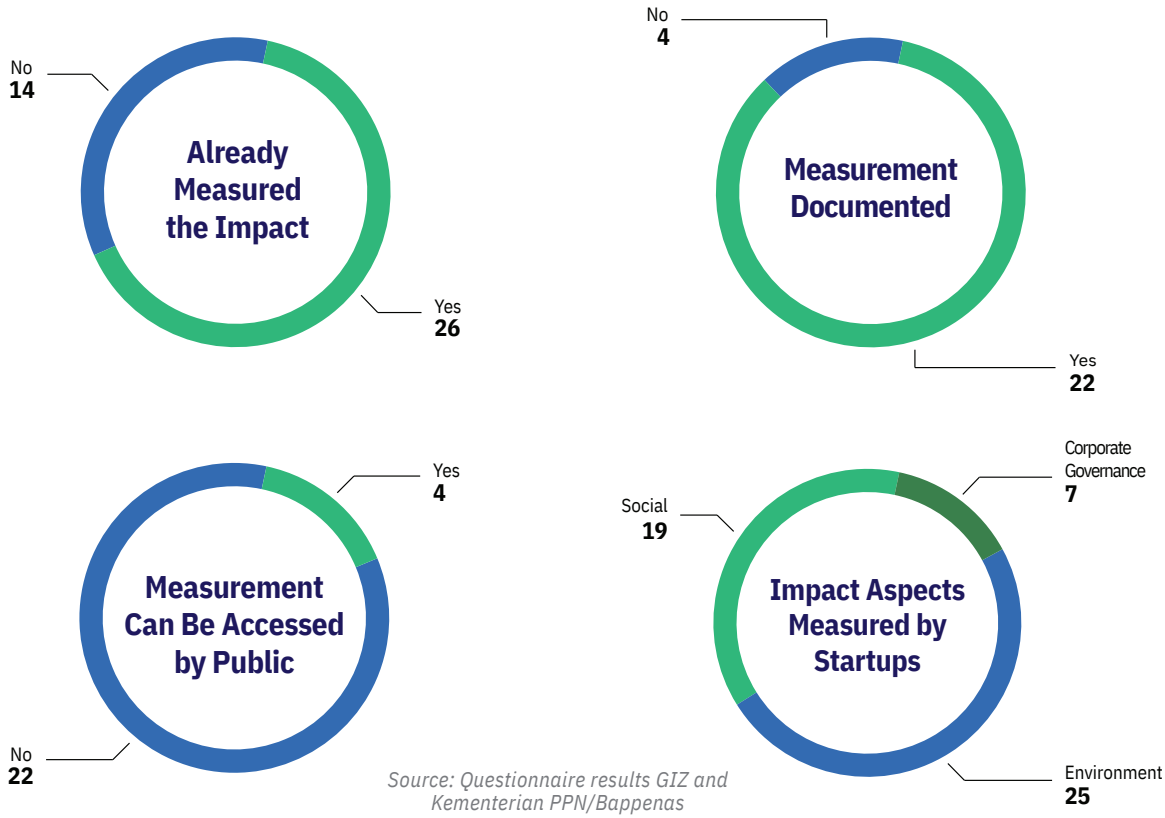
Capital Providers



Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

A total of 68.4% of startups have measured their impact. 84.6% of those that have measured their impact have documented their measurements. However, only 15.4% of companies have made this documentation publicly accessible. Most startups associate impact measurement with environmental aspect, followed by social and corporate governance aspect. As for enablers, the social aspect is the most measured aspect when measuring impact.

Impact Measurement
Green Technology Sector in Indonesia



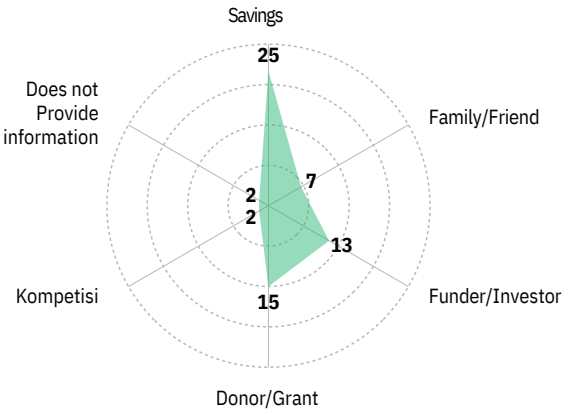
Source: Questionnaire results GIZ and Kementerian PPN/Bappenas

Funding

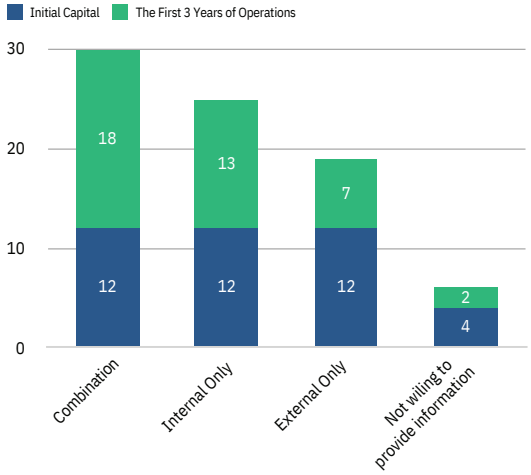
The green technology startup respondents' initial capital sources were mostly from their own savings (mentioned 25 times), followed by donors or grants (mentioned 15 times), financiers/investors (mentioned 13 times), family/friends (mentioned 7 times), prizes from competitions (mentioned to 2 times), and the remaining 2 were not willing to provide information. During the first three years, startups respondents began to rely less on external sources of funds as they started to make profits.

The Initial Capital Source for Startup Companies

Green Technology Sector in Indonesia



The Funding Composition of Green-Technology Startup Companies in Indonesia



Note: Respondents are allowed to choose more than one answer.

Source: Questionnaire results GIZ and Kementerian PPN/Bappenas

The majority of clean energy transition startup respondents were able to acquire their first customer within 4-6 months, whereas the circular economy and natural resource management startups were able to acquire their first customer within ≤3 months.

Practical Definition of Impact Investing According to Respondents from Capital Providers

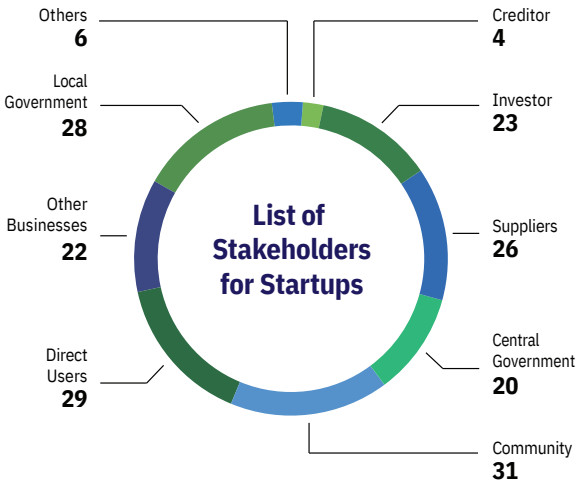
Source: Questionnaire results GIZ and Kementerian PPN/Bappenas

Capital provider respondents defined impact investing as investments that have a measurable positive impact on the environment and social.

The classification of capital providers in Indonesia is divided into venture capital, venture builder, P2P lenders, investment platforms and/or banks, grant providers, loan providers, and intermediary institutions.

Interaction in The Green Technology Ecosystem

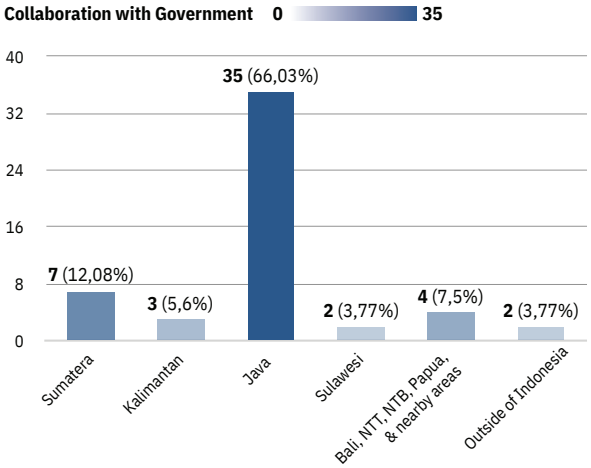
The relationships between fellow green technology industry actors in Indonesia are quite collaborative. This can be seen from the community as the entity that most often appears when startup respondents were asked about their important stakeholders, followed by direct users, local governments, suppliers, investors, and other businesses. Some startups cited that competition with fellow startups that have similar products or services is one of the challenges they face.



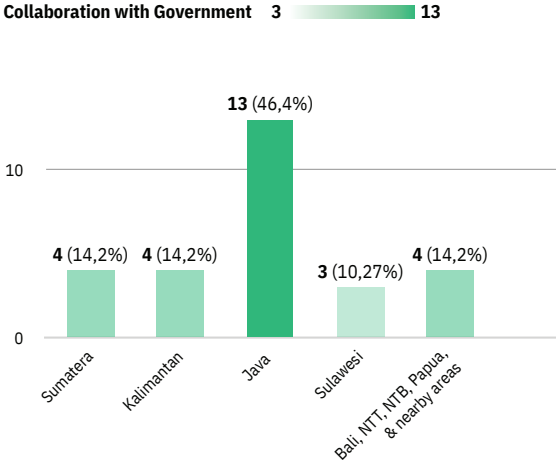
Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

The collaboration of startup respondents with the government is still heavily concentrated in Java, as is the collaboration of enablers with the government. The majority of all areas in Indonesia have been reached by collaboration in various forms, although the number is quite unequal between one area to another.

The Number of Collaborations between Startup and Government
(Based on location collaboration)



The Numbers of Collaboration between Enablers and Governm
(Based on collaboration location)

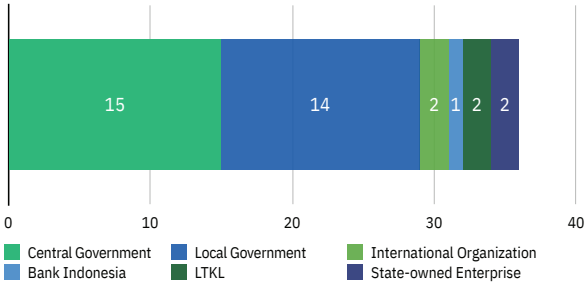


Note: Respondents are allowed to choose more than one answer.
Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

The public sectors with which startup respondents collaborate the most are the central government and local government. Similarly, enablers' collaborations with the government are dominated by the central government and nonministerial government agencies.

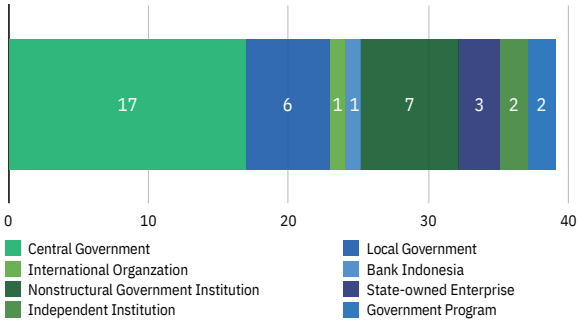
The Public Sectors that Have Collaborated with Green Technology Startup Companies in Indonesia

Note: Respondents are allowed to choose more than one answer



Public Sectors that Have Collaborated with Green Technology Enablers in Indonesia

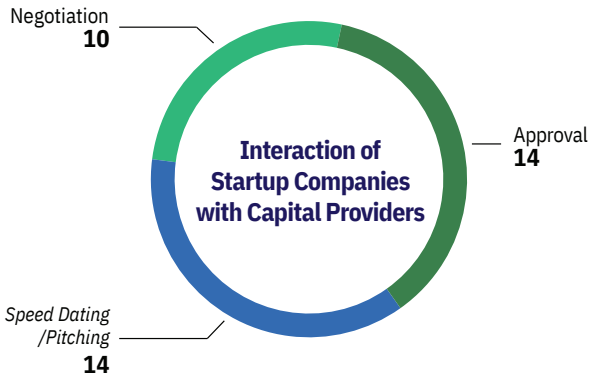
Note: Respondents are allowed to choose more than one answer



Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

All respondents in the startup category had collaborated with the private and public sectors, either one or both. As many as 65.7% have collaborated with both. Not all startup respondents had interacted with both investors and capital providers. If there are respondents who have only ever interacted with one of them, they rather choose to collaborate with capital providers, not enablers.

When interacting with capital providers, only 36.8% of the startup respondents have reached the approval stage for funding. This is not because start-ups are still considered ineligible to receive funding from capital providers. Some cases showed that some respondents are actually quite selective in receiving funding and are often the ones who reject potential funding if it does not match the company's vision.



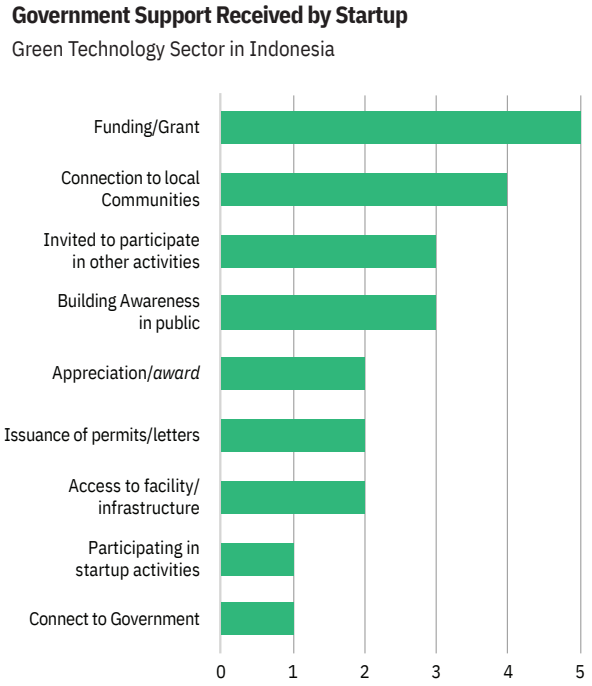
Note: Respondents are allowed to choose more than one answer.

Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

Support and Challenges

The most cited challenges for green tech startups in Indonesia are funding, regulation, and market demand. The top three forms of support from the government that green tech startup respondents have received are the provision of funds or grants, connections to local communities, and being invited to be involved in other activities.

Note: Respondents are allowed to choose more than one answer.



Source: Questionnaire Results by GIZ and Kementerian PPN/Bappenas

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